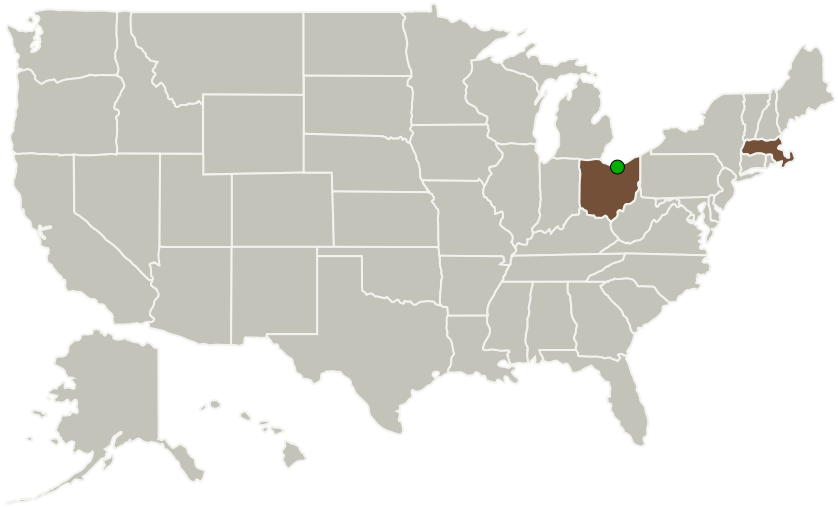
Dual Mode Low Power Hall Thruster, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Sample and return missions desire and missions like Saturn Observer require a low power Hall thruster that can operate at high thrust to power as well as high specific impulse in order to close mission time, mass and delta velocity requirements. This type of thruster is commonly referred to as a dual mode Hall thruster. While the traditional geometry commonly used in a Hall thruster can achieve relatively high Isp operation, they are limited in their ability to achieve much better than 80mN/kW thrust to power. While values of 90-100 mN/kW have been reported they are achieve at by running the thruster at significantly reduce input power. A true dual mode thruster, one that delivers maximum thrust at the thruster design power, must depart from conventional Hall thruster design approaches. In Phase I SBIR Busek will demonstrate a true dual mode thruster that capitalizes on innovative scaling of the plasma discharge and a number of technologies unique to Busek. Our baseline approach is a double discharge cavity 600W thruster with high Isp inner thruster nested inside a high T/P outer thruster the latter capable of 100mN/kW.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Busek Company, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Natick, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138105)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Busek Company, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

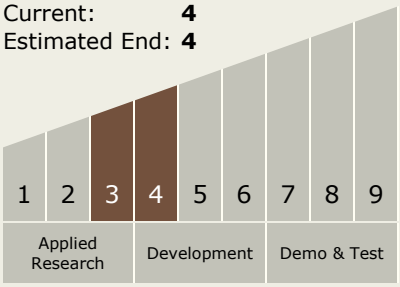
Carlos Torrez

Principal Investigator:

Vlad Hruby

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.2 Electric Space Propulsion
    - TX01.2.2 Electrostatic

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System